20000727.ba v02_n957.bam.20000727

>From ???@??? Thu Jul 27 23:32:02 2000 -0500
Message-Id: <200007280425.e6S4PX114918@sco.theporch.com>
Date: Thu, 27 Jul 2000 23:24:54 CDT
From: Old Tube Radios <boatanchors@theporch.com>
To: Old Tube Radios <boatanchors@theporch.com>
Subject: BOATANCHORS digest 2957

BOATANCHORS Digest 2957

Topics covered in this issue include:

1) Drake Parts: Knobs
   by KB9VU@aol.com
2) Something for Everyone - TEST GEAR, Tubes, Boat Anchors...Low$$
   by David Jordan <wa3gin@erols.com>
3) ISP Problems
   by GeorgeHumphrey <gah@koyote.com>
4) RE: SHIPS 275
   by "ROBERT W. DOWNS" <RWDowns_WA5CAB@compuserve.com>
5) Something for everyone "SOLD OUT - SOLD OUT - SOLD OUT"
   by David Jordan <wa3gin@erols.com>
6) RE: SP-200 Question
   by "ROBERT W. DOWNS" <RWDowns_WA5CAB@compuserve.com>
7) WLW - ??
   by Chuck Swiger <cswiger@widomaker.com>
8) One more creaks on
   by MODSTEPH@ACS.EKU.EDU
9) Transformer ID
   by w5sum@nwla.com
10) HV Transformer
   by w5sum@nwla.com
11) Re: One more creaks on
   by Arden Allen <gumbear@pacbell.net>
12) 455 mech filter wanted
   by BEN NOCK <G4BXD@compuserve.com>
13) WW II Equipment
   by "Rhett T. George" <rtg@ee.duke.edu>
14) Re: WW II Equipment
   by William Donzelli <aw288@osfn.org>
15) Roll Your Own Racks
   by "Shaun Merrigan" <smerriga@compusmart.ab.ca>
16) Re: WW II Equipment
   by =?iso-8859-1?Q?Andr=E9_Guibert?= <aguibert@sympatico.ca>
17) microwave comms
   by Peter McCollum <saipan59@juno.com>
18) Re: WW II Equipment

by W7QHO@aol.com
19) Product Detector for SX-110 -- Chapter III -- Fini
by Arden Allen <gumbear@pacbell.net>

From: KB9VU@aol.com
Message-ID: <97.89d0dc6.26afa065@aol.com>
Date: Tue, 25 Jul 2000 22:01:09 EDT
Subject: Drake Parts: Knobs
To: Old Tube Radios <boatanchors@theporch.com>
MIME-Version: 1.0
Content-Type: text/plain; charset="US-ASCII"
Content-Transfer-Encoding: 7bit

I have finally received the final count of 4 line knobs in the remaining inventory.

There are 150 NOS push on knobs left. They are packed in 5 bags. Three bags of 25 knobs with regular springs, 1 bag with 24 knobs (with a half round spring insert instead of the curved spring) and 1 bag with 26 knobs with regular springs.

I'd like to sell them by the bag. $4 per knob. Doling them out a few at a time won't work with my travel schedule.

There were no more set screw knobs.

Thanks

Mike, KB9VU

Message-ID: <397E5866.687ACC88@erols.com>
Date: Tue, 25 Jul 2000 23:17:59 -0400
From: David Jordan <wa3gin@erols.com>
MIME-Version: 1.0
To: Old Tube Radios <boatanchors@theporch.com>
Subject: Something for Everyone - TEST GEAR, Tubes, Boat Anchors...Low$$
Content-Type: text/plain; charset=iso-8859-1
Content-Transfer-Encoding: 8bit

Hi Folks,

Cleaning out the basement Ham/electronics shopÖall items are offered ìas isî (we believe everything works), you pay shipping. Responses must be received no later than 8/01/00. Email direct to CYFELL@starpower.net.

All items are used, unless otherwise stated (NIB). Electrically and electronically we believe all items are in good working condition. In general the ratings for cosmetics would be around an 8-8.5 out of 10.

We tried to price this stuff so that you get a very fair deal when you add in the shipping. If you donít like the price listed, please make an offer.

Lastly, our preference is to ship all this gear to one ham that is going to use the stuff or pass it on to other new hams. For those considerations weíll sell it all for $150 (OBO). plus shipping. All will probably fit in two boxes.

QTY	Item Description	Price
3-4(?)	Amperex 8163 (YD1130)*	make offer
1	3RP1 O-Scope CRT	$15.00
1	Tektronics 211 Portable Scope w/m	$30.00
1	Triplett 310-C Pocket VOM (NIB)	$15.00
1	Triplett 310-C Pocket VOM	$15.00
1	Triplett 310-FET Pocket VOM	$15.00
1	RCA WV-77E Voltohmyst VTVM	$15.00
1	PC HDWR TOOL KIT w/case(New)	$15.00
1	10AMP Battery Charger 6+12volt	$10.00
1	Clegg FM 27B Two Meter Transceiver	$10.00
1	RG8 Columbia foam w/ connectors (NIB)	$ 5.00
2	Boxer muffin fans 4.5 inch	$ 7.50
2	Logic Probes (NIB)	$10.00
1	Heathkit HM-15 SWR Bridge	$10.00
1	Hallicrafter HA-8 SPLATTER GUARD	$50.00
1	Hustler Mobile Antennas Fold-over Mast, RM75, RM40 (two), RM20 (two), RM15 (two), RM10, RM2.*	$50.00

* these tubes have very similar specs to the 3-400Z, 5 volt filament,
3000 volt
   for the plates, etc. I may have four of these but only found three
today.

**these are the low power coils, dirty, but otherwise appear in very
good
   condition. Will not break up the set.

==

Thanks,
dave
WA3GIN

Message-Id: <3.0.6.32.20000725223619.00798600@mail.koyote.com>
Date: Tue, 25 Jul 2000 22:36:19 -0500
To: Old Tube Radios <boatanchors@theporch.com>
From: GeorgeHumphrey <gah@koyote.com>
Subject: ISP Problems
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"

Sorry for the bandwidth, but my ISP says a cut cable in Atlanta may have
caused the loss of some of my e-mail. If you have ordered and haven't
received a reply or tried to order and couldn't get through to order the
neat power supplies or the large contactors from me, please e-mail me offline.

73 George KC5WBV
gah@koyote.com

Date: Wed, 26 Jul 2000 00:16:38 -0400
From: "ROBERT W. DOWNS" <RWDowns_WA5CAB@compuserve.com>
Subject: RE: SHIPS 275
To: Old Tube Radios <boatanchors@theporch.com>
Message-ID: <200007260016_MC2-AD87-752A@compuserve.com>
MIME-Version: 1.0
Content-Transfer-Encoding: quoted-printable
Content-Type: text/plain;
      charset=ISO-8859-1
Content-Disposition: inline

Groups,

Had several inquiries for the following info. Publication date is 01
August 1944. This is the same as the blue cover GBC bound copies that ma=

ny
of us bought some years ago. I'm not stretching a point to say that thes=
e
will be "slightly" better quality than those. :-)

Also, second most common question - SHIPS 275 became NAVSHIPS 900,116 dat=
ed
15 April 1946, last revised 01 October 1952. According to the foreword,
all copies of SHIPS 275 were supposed to be destroyed.

A related pub is NAVSHIPS 900,105, Catalogue of Electronic Test Equipment=
,
dated 10 July 1945.

73,
Robert Downs
WA5CAB
Houston

Message-ID: <397EDC27.2F6025F9@erols.com>
Date: Wed, 26 Jul 2000 08:40:07 -0400
From: David Jordan <wa3gin@erols.com>
MIME-Version: 1.0
To: Old Tube Radios <boatanchors@theporch.com>
Subject: Something for everyone "SOLD OUT - SOLD OUT - SOLD OUT"
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit

HI FOLKS

Thanks to everyone that responded. The entire lot has been requested by
several folks. When we have a confirmed sale I'll identify the person
so that those of you that wanted individual items may contact him
directly...

Thanks again,
dave
WA3GIN

Date: Wed, 26 Jul 2000 08:56:02 -0400
From: "ROBERT W. DOWNS" <RWDowns_WA5CAB@compuserve.com>
Subject: RE: SP-200 Question
To: Old Tube Radios <boatanchors@theporch.com>
Message-ID: <200007260856_MC2-AD90-5AAE@compuserve.com>
MIME-Version: 1.0
Content-Transfer-Encoding: quoted-printable

```
Content-Type: text/plain;
      charset=ISO-8859-1
Content-Disposition: inline

John,

OK.  That makes it equivalent to the BC-779-(*).

BTW, has anyone heard anything out of Bill Sorsby, N5BU in the =

last year or so?  He picked up all of my Super Pro collection.  =

Lives (or lived) in the Dallas area.  I came across a few more bits =

and pieces and sent him several emails last year (or could even =

have been two years ago) but never got any response.

Message text written by Old Tube Radios
>       Robert, mine has:
        100-200 kcs
        200-400 kcs
        2.5-5.0 Mcs
        5.0-10.0 Mcs
        10.0-20.0 Mcs
<



Robert Downs
WA5CAB
Houston

------------------------------
Message-Id: <4.3.1.1.20000726084945.00d38310@192.168.0.134>
Date: Wed, 26 Jul 2000 09:00:36 -0400
To: Old Tube Radios <boatanchors@theporch.com>
From: Chuck Swiger <cswiger@widomaker.com>
Subject: WLW - ??
Mime-Version: 1.0
Content-Type: text/plain; charset="us-ascii"; format=flowed

At 11:31 PM 7/25/00 +0100, you wrote:
>Many thanks to those who e-mailed me direct.
>
>I've now found the list (at
>http://www.oldradio.com/archives/nelson/origins.call-list.html)
```

At the risk of veering dangerously off topic, altho I'm interested in the history and engineering of powerful transmitters - is the entry for WLW a joke - "Worlds Lowest Wages" :))

I can't believe Powell Crosley would officially christen it thusly!

Maybe it should have been "Worlds Largest Water-cooled-ether-blaster"

Chuck
KB4NEW
cswiger@widomaker.com

Date: Wed, 26 Jul 2000 10:25:44 -0400 (EDT)
From: MODSTEPH@ACS.EKU.EDU
Subject: One more creaks on
To: Old Tube Radios <boatanchors@theporch.com>
Message-id: <01JS7WOSFKNM00DSB0@ACS.EKU.EDU>
MIME-version: 1.0
Content-type: TEXT/PLAIN; CHARSET=US-ASCII

Gang,

At the top of my "projects" pile/list has been a "Knight 50 Watt Transmitter" (sic) given to me by my older brother Ben K9KOM. Main thing it suffered from was poor construction techniques by whomever... including managing to give the LOAD capacitor a good squeeze to short plates together.

Took long enough to get that unsquoze, but it was still erratic (did turn up a problem in my VFO - fixed that next). Last night I found "the rest of the story," two cold solder joints, one of which visible where the wire had disconnected itself finally and was just hanging there.

Cranked wide open it is putting out 25 watts (6AG7 -> 807) and I got a nice signal report from a guy near Charlevoix, MI, about 500 miles north, on 40 meters last night. One more up and running!

Hmmmmm... Maybe we need a logo of sorts which we can wear, sort of like the old gunfighter with the notches on the gun. Maybe a test probe with notches (for each piece of equipment repaired/restored), ar a small soldering iron... Or maybe a large "black beauty" capacitor... (still with notches).

73, Al N5AIT 8-)

From: w5sum@nwla.com
To: Old Tube Radios <boatanchors@theporch.com>
Date: Wed, 26 Jul 2000 10:35:14 -0500
MIME-Version: 1.0
Content-type: text/plain; charset=US-ASCII
Content-transfer-encoding: 7BIT
Subject: Transformer ID
Message-ID: <397EBEE2.29878.256F3D@localhost>

I just received a large plate transformer. It is made by Chicago
Transformer Co but has a Hallicrafters p/n 52C219.... also
has number TFIA02YY on it.

split primary so it will work 120 or 240, and the secondary is listed
at 5760V @ .321 ma   or 4800V@ .475 ma

can anyone tell me what piece of equipment this came out of? Is
this a BC610 transformer?

thanks in advance

Ronnie

```
**************************************
*                                    *
*         W5SUM - Ronnie Hull        *
*         ex: WN5AIA - WB5AIA        *
*       http://www.glowbugs.com      *
*                                    *
**************************************
```

From: w5sum@nwla.com
To: Old Tube Radios <boatanchors@theporch.com>
Date: Wed, 26 Jul 2000 13:57:40 -0500
MIME-Version: 1.0
Content-type: text/plain; charset=US-ASCII
Content-transfer-encoding: 7BIT
Subject: HV Transformer
Message-ID: <397EEE54.14711.368D78@localhost>

okay having identified the HV transformer that I have here as one
out of a BC610, I'm back to the search. This transformer does not
deliver near enough current. Its in good
shape however and if someone wants or needs it.. give me a call

I need a HV Transformer with at least 750ma of current available, preferably an amp. Im aiming at a final plate voltage of 4-5KV.

thanks in advance

Ronnie

Ronnie

```
**************************************
*                                    *
*          W5SUM - Ronnie Hull       *
*          ex: WN5AIA - WB5AIA       *
*        http://www.glowbugs.com     *
*                                    *
**************************************
```

Date: Wed, 26 Jul 2000 15:05:32 -0700
From: Arden Allen <gumbear@pacbell.net>
Subject: Re: One more creaks on
To: Old Tube Radios <boatanchors@theporch.com>
Message-id: <0FYB00GWDRZ2ZK@mta5.snfc21.pbi.net>
MIME-version: 1.0
Content-type: text/plain; charset=ISO-8859-1
Content-transfer-encoding: 7bit

Hi Al;

Another hollow state peanut whistle for the cause.

> Hmmmmm... Maybe we need a logo of sorts which we can
> wear, sort of like the old gunfighter with the notches on the
> gun. Maybe a test probe with notches (for each piece of equipment
> repaired/restored), ar a small soldering iron... Or maybe a
> large "black beauty" capacitor... (still with notches).

I used to save blown transistors in a gallon pickel jar when I was in the repair business. I finally tossed them.

Hang those old wax leakers and black uglies along with the toasted resistors who's ohms have drifted to the next county on the wall outside your shack/work shop. Makes a great trophy display. When your friends come over you can, 807 in hand, spin yarns about how you "bagged this one what was responsible for all the TVI that caused the Pentagon to launch a retaliatory strike on Eastern Mongolvania". And the old '31Natiocrafters NCSX-69Q has never worked better!

Arden Allen   KB6NAX   Vallejo, CA   gumbear@pacbell.net

Date: Thu, 27 Jul 2000 13:01:40 -0400
From: BEN NOCK <G4BXD@compuserve.com>
Subject: 455 mech filter wanted
To: Old Tube Radios <boatanchors@theporch.com>
Message-ID: <200007271301_MC2-ADBD-35AD@compuserve.com>
MIME-Version: 1.0
Content-Transfer-Encoding: quoted-printable
Content-Type: text/plain;
      charset=ISO-8859-1
Content-Disposition: inline

I picked up a KW2000A at Rugby, "working fine, just needs a re-tune" ! =

The re-tune it needs is a new 455khz mechanical filter ! Some re-tune. =

Opening the old one it had disintigrated, the foam had turned to a funny =

gooey stuff and wires were off the end plates. I tried to clean and
re-solder =

it but to no avail. Sadly, it passed away. So, I need a valve type mech
filter, =

455khz, any b/w, I'm not really bothered. =

Reminds me of the scope bought at Elvaston. "Yes mate (the use of 'mate'
should have warned me really) Yes mate, its working fine". Needless to
say, =

when examined, it was hardly likely to work with its mains tranny
disconnected, the
eht diodes out and wires hanging off all around. And this was from a "clu=
b"
stand !
Seems you just can't trust anyone these days.

So, if anyone either has a spare Kokusai 455khz filter for a KW or knows =
of
a supply
of suitable items, I'd be most obliged. =

Failing that, anyone want a nice ht psu unit with built-in speaker ?

cheers, Ben G4BXD.

From: "Rhett T. George" <rtg@ee.duke.edu>
Date: Thu, 27 Jul 2000 15:15:15 -0400
Message-Id: <200007271915.PAA18513@champ.ee.duke.edu>
To: Old Tube Radios <boatanchors@theporch.com>
Subject: WW II Equipment

- Greetings -

While gathering appreciation of WW II military electronics by perusing several documents, several questions popped into mind.

The instruction booklet for test equipment IE-46-B describes separately the frequency meter BC-906-D, the radio receiver BC-1066-B, and the signal generator I-196-B. It describes the use of the I-Band for testing SCR-595-A (or AZ) and G-Band for testing Scr-695-A (or AZ). Will someone please tell me what frequencies are in each of these bands and, hopefully, what "I" and "G" might mean.

TM 11-805 is for the transmitting components of SCR-197-C (or -D or -F). The transmitter is a BC-325-B, operating from 1500 kc to 18000 kc and capable of 400 watts CW or 50 watts modulated (looks to be suppressor grid modulated). No doubt this is army equipment since it is specified to be mounted in a K-18-C (or -D or -F) truck. The picture suggests that the truck is a short (commercial) van, possibly an International. Another pic shows the generator with drive belts to the PRO shaft of the transmission. Will someone please tell me what was the application for this rig. Was it designed to be operated remotely from the signal source? Was two-way communication involved? The -197- seems to have only a modest monitor receiver included. Curiously, the schematic indicates a 913 CRT serving as the modulation indicator. Also curious is the following quote,

> "NOTE; In Radio Transmitter BC-325-C, coil 514-2 is assembled over an absorption loop which is fastened to the shelf. This loop should not be removed, or the 2nd IA may oscillate when operating at low frequencies."

Federal Telegraph Company prepared the manual and may have made the equipment.

All information, correct and otherwise, is gratefully received.

73   Rhett - KE4HIH

Date: Thu, 27 Jul 2000 16:33:47 -0400 (EDT)
From: William Donzelli <aw288@osfn.org>
To: Old Tube Radios <boatanchors@theporch.com>
Subject: Re: WW II Equipment
Message-ID: <Pine.SUN.3.91-FP.1000727160420.27463B-100000@osfn.org>
MIME-Version: 1.0
Content-Type: TEXT/PLAIN; charset=US-ASCII

> The instruction booklet for test equipment IE-46-B describes separately the frequency meter BC-906-D, the radio receiver BC-1066-B, and the signal generator I-196-B. It describes the use of the I-Band for testing SCR-595-A (or AZ) and G-Band for testing Scr-695-A (or AZ). Will someone please tell me what frequencies are in each of these bands and, hopefully, what "I" and "G" might mean.

IE-46-B is a set used to tune up Mark III IFF transponders - a confidential item during the war, thus the lack of numbers in the manual. Anyway, I and G are two of the bands that the IFF sets worked at, up in the VHF region. Mark III IFF tried not to be a kludge that Mark II was, but it failed to bring a nice uniform system to the Allies, thus the sub-bands I and G (and a few others I can't think of, maybe rarely used bythe U.S.).

William Donzelli
aw288@osfn.org

From: "Shaun Merrigan" <smerriga@compusmart.ab.ca>
To: Old Tube Radios <boatanchors@theporch.com>
Subject: Roll Your Own Racks
Message-ID: <LPBBJKAGEOKFPIAEFDNGGEAECJAA.smerriga@compusmart.ab.ca>
MIME-Version: 1.0
Content-Type: text/plain;
charset="iso-8859-1"
Content-Transfer-Encoding: 7bit
Date: Thu, 27 Jul 2000 17:27:03 -0600

I just finished building my third metal open frame rack, and I thought that other BA'ers may be interested in what I did.

I used slotted angle industrial shelf material. Not the stuff you find at Home Depot, but the stuff you find at an industrial supply outlet. It comes in various sizes, but 1 5/8" x 1 5/8" x 7' lengths is what I used. 9 pieces of this, with some 1/4" bolts, nuts and washers is enough to build a 7' open frame rack with 3 adjustable levels in addition to the top and bottom (5 total). The

materials total was about $80 cdn. Had I chosen used
racking, it would have been even cheaper.

I cut all of the slotted angle manually, with a good quality
hacksaw and blades. Total assembly time was about 4 hours.

The advantages of using this material are many: relatively
light weight, very flexible configuration,
completely adjustable levels (using your
imagination, you can even dream up an angled mount for a computer
keyboard), extremely strong, moveable (with HD surplus casters),
easy access to wiring and cabling, can be disassembled, great
cooling:-)

In addition, I find the open frame "laboratory look" very
appealing (no kids or pets here) :-)

A word of caution however, it is easy to get carried away using
this material. I now have a computer desk, overhead shelves,
a workbench, 3 racks .... :-)

Shaun

--
Shaun Merrigan
smerriga@compusmart.ab.ca

Message-ID: <000401bff821$eac43680$4815fea9@b1yhpg64>
From: =?iso-8859-1?Q?Andr=E9_Guibert?= <aguibert@sympatico.ca>
To: Old Tube Radios <boatanchors@theporch.com>
Subject: Re: WW II Equipment
Date: Thu, 27 Jul 2000 19:23:38 -0400
MIME-Version: 1.0
Content-Type: text/plain;
charset="iso-8859-1"
Content-Transfer-Encoding: 7bit

Bonjour William and All
The signal gen. reference had me look at an English WW2 sig.
gen. in my collection, never could find
anything on it.
Name plate: Signal Generator 10SB/5 for receivers R3002 and
R3003.
Wooden box- 2v cell and 120vdc supply.
Suspect that it was use for the English ABK system.
Any info. would be appreciated.
Andre

To: Old Tube Radios <boatanchors@theporch.com>
Date: Thu, 27 Jul 2000 20:07:57 -0600
Subject: microwave comms
Message-ID: <20000727.200759.-321263.0.saipan59@juno.com>
MIME-Version: 1.0
Content-Type: text/plain
Content-Transfer-Encoding: 7bit
From: Peter McCollum <saipan59@juno.com>

Sorry for the off-topic post, but I would like to make contact with a HAM that is familiar with modifying Qualcomm Omnitracs gear for ops on 10 GHz.

Thanks, Pete
saipan59@juno.com

____
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http://dl.www.juno.com/get/tagj.

From: W7QHO@aol.com
Message-ID: <6e.18f7702.26b25784@aol.com>
Date: Thu, 27 Jul 2000 23:27:00 EDT
Subject: Re: WW II Equipment
To: Old Tube Radios <boatanchors@theporch.com>
MIME-Version: 1.0
Content-Type: text/plain; charset="US-ASCII"
Content-Transfer-Encoding: 7bit

Rhett,

The SCR-197 was an early WW-II mobile HF station. Frequency coverage was 1.5 - 18 MHz and the transmitter was a BC-325 as you mentioned. On the receiving side, the system included three BC-342s and one Hallicrafters Sky Champion. The transmitter, receivers and BC119 control box were mounted in a trailer pulled by a largish van which also carried a generator to power the system. A 45 ft. mast was used for transmitting and a 15 ft. whip for receiving.

The system had a couple of major shortcomings. The vehicles were not suited for use in rough terrane and the system could not be operated while in motion. It was replaced early on by the SCR-399 (BC-610 transmitter, BC-312 and 342 receivers) which was produced in large numbers and used in all theaters throughout the war (and for a considerable time thereafter).

A good picture of the SCR-197 can be found in the November 1942 Radio News "Special U. S. Army Signal Corps Issue."

Dennis DuVall, W7QHO
Glendale, CA

Date: Thu, 27 Jul 2000 21:22:50 -0700
From: Arden Allen <gumbear@pacbell.net>
Subject: Product Detector for SX-110 -- Chapter III -- Fini
To: Old Tube Radios <boatanchors@theporch.com>
Message-id: <0FYE00ARC45UCN@mta6.snfc21.pbi.net>
MIME-version: 1.0
Content-type: text/plain; charset=ISO-8859-1
Content-transfer-encoding: 7bit

Modiphiles;

Onward to the audio modifications. The idea is to reduce the 5% total harmonic distortion (THD) at 1 watt output to a "hi-fi" level. What defines "hi-fi" is a contorted version of the old saw, "what you get is what you hear". I measured the voltage gain from the 6SC7 1st audio amp grid to the 6K6 plate, about 750. I thought the gain available was a little shy of what would be desirable for trying to pick signals out of the hiss on 10 meters so I arbitrarily decided I could use a gain of 1000 in the new circuit. After thinking about using a pentode in place of the original single triode circuit further evaluation indicated I would have to use a dual triode, another 6SL7. The SX-110 tone control switch adds a series capacitor and resistor to ground at the 6K6 plate for the Medium tone position and shorts out the resistor for the Low position. The High position removes the RC combination entirely. The new circuit having feedback wrapped around it would make tone control inside the feedback loop difficult to manage. I would have to move the tone control to the input side where there would be trouble with AC hum coupling from the AC power switch on the back of the tone control switch. Two birds were clobbered with one swing of the mace, the plate circuit of the first audio triode would be the place to put the tone control function because the amplitude of the audio would be sufficient by then to drown out any hum, hopefully. That approach complimented the output stage perfectly, i.e., minimum gain in the output stage because of maximum negative feedback for minimum distortion compliments the maximum gain needed in the input stage for minimum hum in the ....(I'm working on my typing speed and get carried away at times).

First experiment was to get the distortion down in the output stage. Fortunately Halli's 500 and 3.2 ohm tapped output transformer was correctly phased for negative feedback to the cathode of the 6SL7 second audio amp's cathode. I kluged a resistive divider from the 3.2 ohm tap to the cathode using a pair of vintage Heathkit R sub boxes. Feeding a 1 KHz triangle wave from my ancient ('68) solid state IEC F51 function generator to the grid I increased negative feedback until I got undistorted triangles on my Tek 503. That occurred at just about all the feedback I could get so I switched to a hookup recommended by Scott Robinson to put the cathode in series with the output transformer secondary. That worked neato. The second amp grid to 6K6 plate voltage gain was now down to 55. The amount of feedback achieved was 750/55=get out your DB converters. That leaves a gain of 18 in the for the 1st stage, ...PERFECT! The gain in the input stage would be set by cathode degeneration which would give low distortion.
Everything is coming up roses. Using a Burr Brown one-of-a-kind-oddity low distortion audio generator (.04% THD) with an HP 334A distortion analyzer I now had only 0.5% THD at 1 watt output to a 4 ohm load. That's what I call "hi fi", not too bad for a single ended pentode toob amplifier.

Some of you, no doubt, are wondering if my new amp is "stable". Of course not, is my answer. At somewhere around 100 KHz it's ready to take off as evidenced by a huge increase in gain while sweeping from zip to daylight. Taking a hint from a circuit in a GE tube manual I started by adding a series RC across the output transformer primary. With IK and .0015uF I got a nice flat response with a slight rise of less than 1 DB before a smooth rolloff with -3DB occurring at 18KHz. Well, that was simple. I tried all the tricks of using different loads, speakers, open circuit, and up to 0.1uf. The 0.1 did some real damage to the phase margin as could be seen by pronounced ringing on square waves but a .0.02 only caused a slight increase in peaking at the leading edge. I think it is reasonably safe to operate with loudspeakers.

Now to add the first audio stage. Getting the gain right was simple enough, just turning the switch on the R box I ended up with 4.7K which is a great place for the 6SL7 to be biased. A small single ended tube output transformer does not have enough iron to deliver full power below approximately 100 Hz so to avoid horrible intermodulation response from low bass notes I guesstimated .0033uF from the plate of the 1st amp to the grid of the 2nd amp.

Now to test the overall amplifier. Whoops! What happened to the feedback compensation in my output stage? A few more hairs on the floor later I reconnected the function generator to the grid of the second amplifier and everything was peachy keen again. So! My new fangled hi fi amp doesn't like to be driven by the high plate circuit impedance of the 1st amp, it likes the low impedance of the function generator. Playing with values in my across primary network I could not get things to be nearly as good as before. I started thinking about adding some differentiation between the second amp and the output amp but that would mean sacrificing low distortion in the 1st stage, ...only as a last resort.

Looking at the grid circuit where my function generator was connected I wondered if the effect was grid-cathode capacitance in nature. If I add some capacitance from grid to ground would that lower the high frequency input impedance? The answer must be approximately "yes" because 56pF was the value I arrived at when tuning the total amp to get the same stability behavior as before. There is some tube physics and attribute appreciation missing from my fumblings, once again I meet my limits. With audio now going in at the grid of the 1st audio amp the final lashup now passed all the stability tests. I then added the tone control function to the plate circuit of the 1st amp using my Heathkit R and C boxes until I was satisfied with what values were needed for a good selection of frequency response. The final -3DB points in the High tone position ended up as 55 and 15,000 Hz, which listening tests proved to be smooth sounding and free of low frequency distortion on three different speakers including a reasonably efficient JBL bookshelf system. Would it have been simpler to use a modern day network analyzer with FFT spectrum analysis, and all that rot? Nope. I call this the triumph of "ten thumbs engineering".

I spent the last few days doing listening tests to find out what I really had wrought. The final result is not without fault. On SSB there is a faint hum coming from the 6SA7 when volume is cranked up on weak 10 and 15 meter stations but inaudible on a small, non-bassy speaker. With the volume control at near maximum I had lots of hiss on 10 meters which I wanted and also got a mild motorboat cruising through the spray of noise. Too much audio gain as the product detector is also an audio amplifier. Fiddling with capacitors I determined it could be eliminated not with more capacitance (I'm running out of room for more parts) but a with a separate well filtered B+ branch for the 6SA7. I decided not to bother with adding that because I won't be using SSB seriously on 10 and 15 meters with this radio because of the local oscillator being too drifty for serious listening and the lower bands don't need as much audio gain.

This has been a fun project, one done without a great amount of rhyme or reason except to fix up a desperately unsatisfactory receiver. I had partial success in doing that as the level of dissatisfaction has only increased as I learned what I really was working with, a rather ordinary, unimaginative by 50's standards radio receiver that was still being built way past a time when technology had required much better for the price. That's where my Drake 2C came to take the lead. A small lesson in the progress of technology.

For those interested in the details of my SX-110 product detector and audio modifications I produced an electronic schematic diagram of the new circuits which I will send to anyone requesting a copy by e-mail or by hardcopy for an SASE. The electronic version is a graphic in a Microsoft Word 7 .doc file so most anyone can view and print it. Thanks for reading my little trilogy and keep them irons smokin'!

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